

REMARKS

Claims 1, 3, 4, 13-15, 20-22 and 25-30 are pending in this application. Claims 7, 9, 10, 23 and 24 have been cancelled. Claims 1, 13, 20, 25 and 28 have been amended. Applicants reserve the right to pursue the original claims and other claims in this application and in other applications.

The drawings stand objected to under 37 C.F.R. § 1.83(a) as not showing every feature of the invention specified in the claims. The Office Action (page 2) states that the substrate must be shown or the feature cancelled from the claims.

Claims 1, 3, 4, 13-15, 20-22 and 25-30 also stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The Office Action (page 3) states that Applicant has failed to disclose an embodiment having a substrate and that nowhere in the original disclosure is the term "substrate" used or shown. Applicants traverse both the objection and the rejection under 35 U.S.C. § 112, first paragraph.

It is clear that the subject matter described and claimed in this application is directed to an active pixel sensor (APS), e.g. see pages 4-6 of the specification, which is, *per se*, well known in the art as fabricated on an integrated circuit structure. In the described and claimed invention, certain APS structures are provided within a P-well while other APS structures are provided outside the P-well. This also clearly conveys to one of ordinary skill in the art that the described and claimed structures are fabricated on an integrated circuit substrate. Nevertheless, in an effort to advance prosecution, claims 1, 13, 20, 25 and 28 have been amended to delete reference to the term "substrate."

Claims 1, 3, 4, 20, 22, 25, 26, 28 and 29 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Merrill et al. (U.S. Patent No. 6,369,853) ("Merrill"). The rejection is respectfully traversed.

Merrill discloses a storage pixel sensor disposed on a semiconductor substrate which comprises a capacitive storage element (e.g., Figure 7B; Abstract). Merrill does not disclose *inter alia*, "an active pixel sensor comprising a P-well; a photoreceptor outside said P-well; an NMOS frame shutter within the P-well" and "an active pixel readout for receiving charges from said NMOS frame shutter," as claimed in amended claim 1. Claims 3-4 depend from amended claim 1, and thus are allowable along with claim 1, for at least the reasons set forth above.

Neither does Merrill disclose an active pixel sensor comprising, *inter alia*, "a P-well; a photoreceptor outside said P-well; an active pixel readout circuit, comprising source follower and row select transistors" and "an NMOS frame shutter comprising sample and hold and reset circuits-fabricated within the P-well, wherein the sample circuit is in direct electrical connection to the source follower transistor of the active pixel readout circuit," as recited in amended claim 20. Because Merrill fails to disclose every limitation of the claimed invention, Applicants respectfully request withdrawal of the rejection of claims 1, 3, 4, 20, 22, 25, 26, 28 and 29 under 35 U.S.C. § 102(e).

Claims 13-15, 21, 27 and 30 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Merrill et al. in view of Yang et al. ("A Snap-Shot CMOS Active Pixel Imager for Low-Noise, High-Speed Imaging"). The rejection is respectfully traversed.

There is no suggestion or motivation to combine the teachings of Yang with Merrill. Contrary to the argument at paragraph 8 of the Office Action, Yang fails to teach anything about an active-pixel sensor comprising a pinned photodiode and frame shutter. Yang is directed to the improvement of snap shot mode of operation,

not frame shutter mode. While Yang makes a cursory statement that "snap-shot mode of operation is also possible with pinned photodiode pixels," Yang expressly distinguishes between "snap-shot mode" of operation and shutter mode. (See Yang at p. 2.7.3 – 2.7.4). In fact, Yang teaches away from frame-shutter operation and states that "compared to imager operation in 'rolling shutter' mode, snap-shot mode of imaging has eliminated row-wise distortion." (See Yang at 2.7.4). Applicants respectfully submit that for at least the reasons set forth above, claims 13-15, 21, 27 and 30 are allowable over Merrill in view of Yang.

Moreover, there is no teaching in either reference of how the combination alluded to at paragraph 8 of the Office Action would be made. Additionally, there is no teaching in either Merrill or Yang of an active pixel sensor wherein a photoreceptor (as recited in application claim 21) or photoreceptor comprising a pinned photodiode (as recited in application claim 14) is fabricated within the pixel sensor substrate and outside the P-well. The above are additional reasons why claims 14, 15 (which depend from claim 14) and 21 are allowable over Merrill in view of Yang.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

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Respectfully submitted,

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